

***Microfilaria sundaicus* sp. n., a *Chabfilaria*-like Parasite (Filarioidea: Onchocercidae) from the Blood of the Horseshoe Bat (*Rhinolophus affinis*) in Flores, Indonesia**

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ABSTRACT: *Microfilaria sundaicus* sp. n. (Filarioidea: Onchocercidae) is described from the blood of a horseshoe bat, *Rhinolophus affinis* (Chiroptera: Rhinolophidae), collected in western Flores, Indonesia. The microfilariae are similar in appearance to the genus *Chabfilaria*. They are sheathed and characterized by having a greater body length (133–177 μ m), greater tail length (15–21 μ m), and longer cephalic space (3–5 μ m) when compared to the 2 species of *Chabfilaria* described from the literature. This is the first report of a *Chabfilaria*-like microfilaria outside of South America and represents the first time a filarial parasite of this description has been found in Chiroptera.

KEY WORDS: Filarioidea, Onchocercidae, *Microfilaria sundaicus*, horseshoe bat, *Rhinolophus affinis*, Flores, Indonesia.

In May 1990, an adult male horseshoe bat, *Rhinolophus affinis* Horsfield, 1923, was captured using a mist net in a banana garden, in Longko village, near Ruteng (8°36'S, 120°27'E), western Flores Island, Indonesia. The island of Flores sits adjacent to Weber's Line on the eastern edge of the Oriental region separated from the Australasian region. The specimen was part of an ongoing biogeographic small mammal survey conducted by the Western Australia Museum (D. Kitchener, pers. comm.). The microfilariae are designated here as *Microfilaria sundaicus*, after the geographical region from which the host was collected.

Materials and Methods

Routine thick and thin blood smears were made in conjunction with specimen processing. The blood slide was subsequently fixed with methanol and stained with Giemsa at 1:15 dilution for 15 min, revealing microfilariae described herein. The formalin-preserved bat from which the microfilariae were found was later obtained for complete necropsy. No adult worm was found; however, additional microfilariae were recovered from the body cavity. Figure 1 was drawn with the aid of a camera-lucida from examination of 10 microfilariae. All measurements are given in micrometers and are expressed as means followed in parentheses by the range.

Results

***Microfilaria sundaicus* sp. n. (Fig. 1)**

HOST: *Rhinolophus affinis*.

LOCATION: Microfilariae in blood, adult unknown.

LOCALITY: Longko village, western Flores Island, Indonesia.

SPECIMENS DEPOSITED: One stained blood film (No. M32872), syntypes, deposited in the Department of Biogeography and Ecology, Western Australia Museum, Perth, Western Australia 6000.

DESCRIPTION: Body slender, sheathed, with both ends blunt and slightly enlarged, nuclei are distinct when stained with Giemsa. Sheath lightly stained. Body 157.5 (133–177) length by 4.9 (4–5) width at level of first cephalic nucleus, 5.4 (5–6) at nerve ring, 5.0 at excretory pore, 5.2 (5–6) at midbody, 4.0 at anal pore and 3.0 at caudal end. Distance from anterior end to nerve ring 36.5 (33–40); excretory pore, 53.0 (50–60); anterior Innenkörper 98.4 (92–105); anal pore 137.9 (118–148). Cephalic space is short 3.8 (3–5) with a ratio of length to width 0.8 (0.6–1.0):1. Innenkörper 3.7 (3–5) long.

Discussion

Because the adult stage is unknown, a valid generic designation is replaced with a collective-group name for young larval Filarioidea, *Microfilaria* Cobbold, 1880. Conforming to Article 1d and special provisions provided in Articles 13b and 42b(i) in the International Code of Zoological Nomenclature (3rd ed., 1985), we propose this microfilaria as a new species within an acknowledged artificial taxon. We have chosen to publish the description as *Microfilaria sundaicus* sp. n., thus making the name taxonomically available.

Based on review of the Filarioidea found in bats and other vertebrates, the microfilariae herein differ from those previously described from

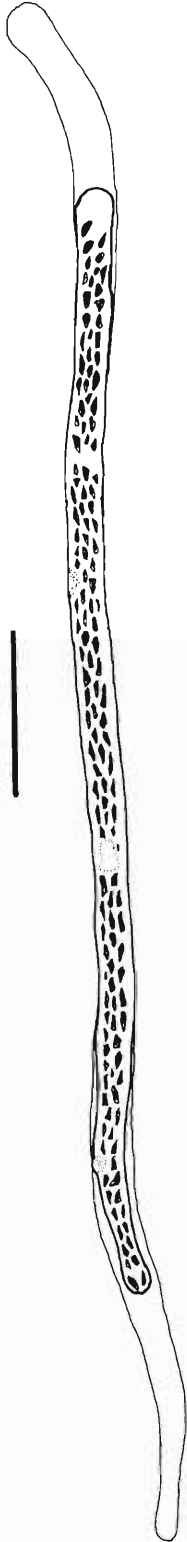


Table 1. Comparison microfilaria measurements of *Chabfilaria jonathani* and *Microfilaria sundaicus* sp. n.

	<i>C. jonathani</i> (Bain et al. 1983)	<i>M. sundaicus</i>
Number examined	> 10	10
Sheath	Sheathed	Sheathed
Body length	125–138*	133–177
Body width (maximum)	5–6	5–6
Cephalic space length	2	3–5
Tail length	16–18	15–24

* All measurements in micrometers.

the Palearctic, Australasian, and Oriental zoogeographic regions (Anderson and Bain, 1976). Only *Litomosa* Yorke and Maplestone, 1926, and *Josefilaria* Moorhouse, Bain, and Wolf, 1979, have been described from bats in the Oriental region. Both genera have microfilariae possessing a pointed tail. *Chiropterothrips brevicaudata* Yeh, Symes, and Mataika, 1958, and *Microfilaria fijiensis* Yeh, Symes, and Mataika, 1958, described from the fruit bat, *Pteropus hawaiiensis*, in Fiji were found unsheathed, greater in length, and having pointed tails (Yeh et al., 1958). This new microfilaria has a distinctly blunt tail and is sheathed. The Flores microfilaria most closely resembles members in the genus *Chabfilaria*, presently known only from the Americas.

Chabfilaria was first described by Bain et al. (1983) in which *Chabfilaria jonathani* Bain, Purnomo, and Dedet, 1983, was described and *Chabfilaria freitaslenti* (Yeh, 1957) placed in the genus. These 2 species represent the only examples of *Chabfilaria*. The genus has been described as exhibiting rudimentary characters possibly representing primitive members of the Setariinae (Bain et al., 1983). Table 1 lists some of the morphological characteristics differentiating the Indonesian microfilaria from *C. jonathani*. In general, the Indonesian specimens have a greater body, tail, and cephalic space length. The only description given for the *C. freitaslenti* microfilaria was that it was unsheathed. Although a superficial resemblance to *Chabfilaria* is noted, it remains speculative whether or not

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Figure 1. *Microfilaria sundaicus* sp. n. from a horseshoe bat in Flores, Indonesia. Scale bar = 20 μ m.

this microfilaria from Indonesia has any close systematic affinities with the genus. Unfortunately, important structures of the cephalic extremity were not distinct after staining to make accurate comparisons with the description of *Chabfilaria*.

Chabfilaria jonathani was originally described from a 2-toed sloth, *Choloepus didactylus* (Bradyrodidae) from French Guyana, and *C. freitaslenti* from the giant anteater, *Myrmecophaga tridactyla* (Myrmecophagidae) from British Guiana. Both hosts are members of the order Edentata.

This report describes microfilariae from an insectivorous bat (order Chiroptera) indigenous to Indonesia. The microchiropteran *Rhinolophus affinis* (family Rhinolophidae) is composed of 4 subspecies that are geographically widespread and morphologically variable. Based on locality, the Flores specimen is most likely *Rhinolophus affinis princeps* K. Andersen, 1905, the intermediate horseshoe bat (Kitchener et al., 1990). *Rhinolophus a. princeps* has been described from Indonesia, India, Malaysia, and southern China. This genus of bats is restricted to the tropical and temperate regions of the Old World (Walker, 1975).

Although definitive taxonomic identification awaits the description of adult worms, we believe this finding represents a unique species based on the vertebrate host, biogeographic distribution, and morphologic differences seen in the microfilariae compared to those previously described from bats. This is the first report of a *Chabfilaria*-like microfilaria from the Oriental region and represents the first time a filarial parasite of this description has been found in Chiroptera.

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